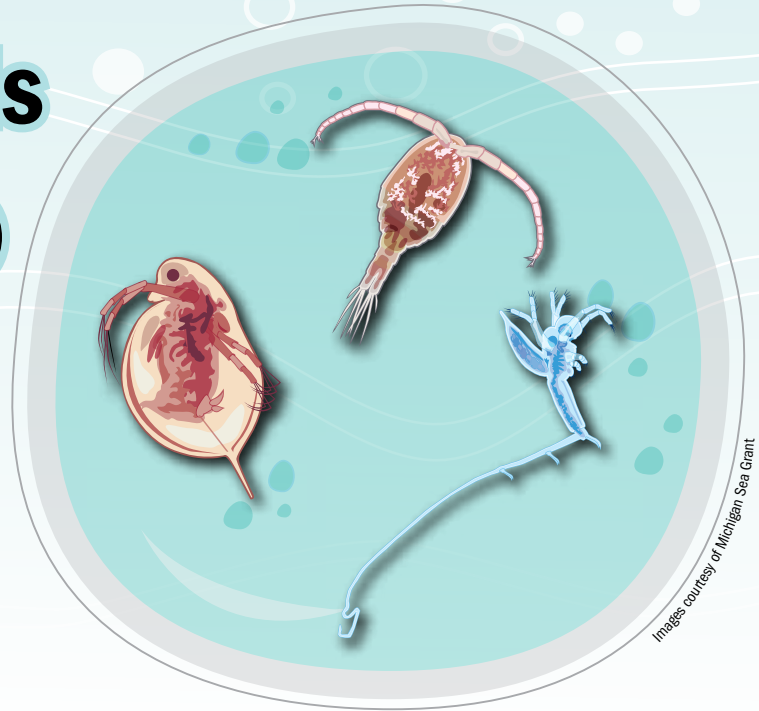


# A Guide to the Microscopic Plants and Animals (Plankton and Zooplankton) of the Great Lakes



Images courtesy of Michigan Sea Grant



NOAA, Great Lakes Environmental Research Laboratory  
Ann Arbor, MI [www.glerl.noaa.gov](http://www.glerl.noaa.gov)

# Waterfleas

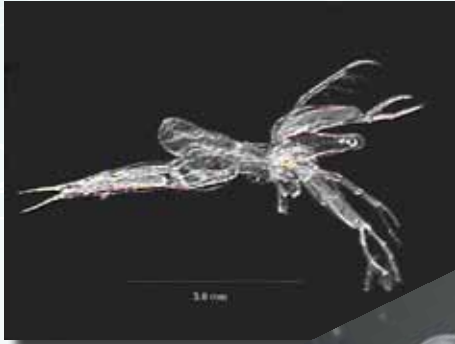
Despite the name, waterfleas aren't fleas or even insects. They are crustaceans - relatives of shrimp and lobster.

Like all crustaceans, waterfleas have a shell called a carapace around their body. The shell may have long spines for protection. Female waterfleas carry their eggs inside their shell until they are ready to hatch. Long antennae are used like arms for swimming and gathering food (algae).



*Daphnia mendotae*

***Leptodora***



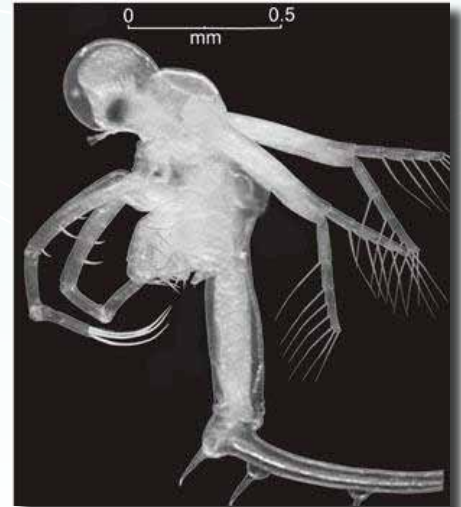
# Waterfleas

**Raptorial Waterfleas** - The biggest waterfleas are predators. They are called raptors because they can catch prey bigger than their mouths and shred them to eat!

***Bythotrephes***  
(Spiny waterflea)



***Cercopagis pengoi***  
(Fishhook waterflea)



# Waterfleas

**Grazer Waterfleas** - All of the other Great Lakes waterfleas are grazers -- they eat algae and bits of plants. Some filter algae from the water with their antennae, others cling to plants and scrape bits from the plant's surface. There are 70 species of waterfleas in the Great Lakes.



*Daphnia mendotae*



*Daphnia mendotae*

*Senecella*



# Copepods

**Copepods are the other large zooplankton in the Great Lakes. Like waterfleas, they are also crustaceans.**

**Copepods look like miniature shrimp with a carapace (shell) tight on their backs. They have many legs.**

**Copepods carry their eggs in one or two sacs. Baby copepods look very different from adults. They lose their shells several times while growing into an adult.**

Female  
*Leptodiaptomus*  
*minutus* with eggs.

Nauplii  
(baby copepod)



# Copepods

**Calanoid Copepods** prefer to eat small active prey but also eat algae. They move their very long antennae, creating a current that draws food into their mouths.



Male *Limnocalanus macrurus*

**Cyclopoid copepods** are carnivores. Their mouths are modified for grasping and chewing. Cyclopoids have short antennae.



*Diacyclops thomasi*

# Copepods

**Harpacticoid copepods** are detritivores. That means they eat dead stuff that falls to the bottom of the water.

They also have short antennae, and their body is a different shape than the cyclopoid copepods. They are shaped like a rectangle -- the cyclopoids are teardrop shaped.

*Nitokra hibernica*  
(image courtesy of USGS)



# Rotifers

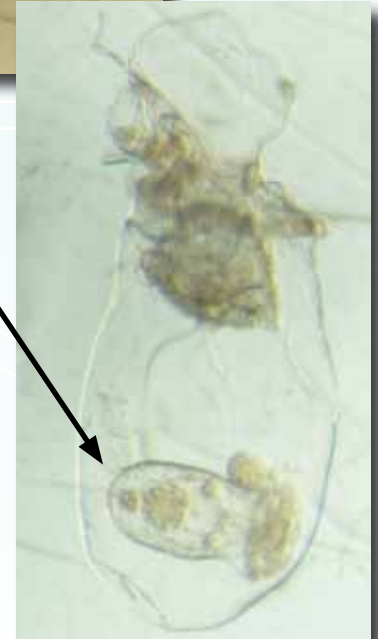
Rotifers are a special group of microscopic animals. They are sometimes called 'wheel animals' because they usually have a ring of tiny hairs (cilia) around their mouth that they move rapidly to create a current that draws water and food (small animals, plants, and bacteria) into their mouth.

The Great Lakes are home to at least 275 species of rotifers.



*Asplachna priodonta*

*Asplachna priodonta*  
with young



*Kellicottia*



# Protozoa

**Protozoa are single-celled primitive creatures. They are so small that we need a bigger microscope to see them. Some protozoa are animal-like while others are more plant-like. Some combine characteristics of both! Some protozoa get energy from light, some are predators, some are decomposers, some are parasites, and some just absorb nutrition from their environment.**

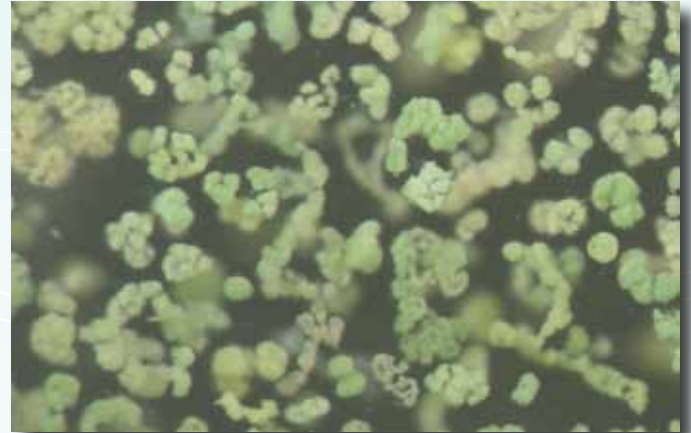


*Strobilidium*

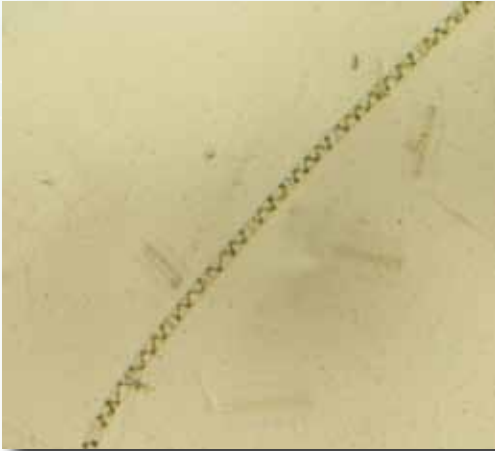
**In the Great Lakes, protozoa are very important because they eat bacteria and return nutrients to the food web when they are eaten by rotifers.**

# Algae

**Algae are the base of the Great Lakes food web. These microscopic plants take energy from the sun and grow rapidly to provide the food source for zooplankton, (waterfleas, copepods, and rotifers).**



*Microcystis*



*Spirogyra*

**The Great Lakes are home to thousands of species of algae.**



*Ceratium*